WHAT IS CLAIMED IS:

1. A switching device that can be irreversibly switched from an electrically isolating off-state into an electrically conducting on-state for use in a configurable interconnect, comprising:

two separate electrodes, at least one of which being a reactive metal electrode; and

a solid state electrolyte arranged between the electrodes and being capable of electrically isolating said electrodes to define said off-state,

wherein the electrodes and the solid state electrolyte form a redox-system having a minimum voltage to start a redox-reaction, the redox-reaction resulting in the generation of metal ions to be released into the solid state electrolyte, and the metal ions being reduced to increase a metal concentration within the solid state electrolyte, and

wherein an increase of said metal concentration results in a conductive metallic connection bridging the electrodes to define the on-state.

2. The device according to claim 1, wherein the turn-on voltage is at most approximately 20 V.

3. The device according to claim 1, wherein the turn-on voltage is at most approximately 1 V.

4. The device according to claim 1, wherein the reactive metal electrode material is selected from a group consisting of Cu, Ag, Au, Al, Na K, Ca, Mg and Zn.

5. The device according to claim 1, wherein one of the electrons is an inert electrode and wherein metal precipitates within the solid state electrolyte from a metal layer adjacent to the inert electrode to enable the inert electrode to act as a reactive metal electrode.

6. The device according to claim 5, wherein the inert electrode material is selected from the group consisting of W, Ti, TiN, Ta, TaN, Ir, IrO, doped Si and Pt.

7. The device according to claim 1, wherein the solid state electrolyte comprises at least one glassy material.

8. The device according to claim 7, wherein the glassy material comprises at least one chalcogenide glass, such as GeSe, GeS, AgSe, or CuS.

9. The device according to claim 1, wherein the solid state electrolyte comprises at least one porous metal oxide, such as WOx or Al2O3.

10. The device according to claim 1, wherein the solid state electrolyte is background doped with at least one metal.

11. The device according to claim 10, wherein the background doping metal is chosen to be the same as the reactive metal electrode material.

12. The switching device according to claim 1, wherein the electrodes are spaced apart from each other to have a distance in the range of from 10 nm to 250 nm.

13. A configurable electrical interconnect comprising at least one switching device comprising:

two separate electrodes, at least one of which being a reactive metal electrode; and

a solid state electrolyte arranged between the electrodes and being capable of electrically isolating said electrodes to define said off-state,

wherein the electrodes and the solid state electrolyte form a redox-system having a minimum voltage to start a redox-reaction, the redox-reaction resulting in the generation of metal ions to be released into the solid state electrolyte, and the metal ions being reduced to increase a metal concentration within the solid state electrolyte, and

wherein an increase of the metal concentration results in a conductive metallic connection bridging the electrodes to define the on-state.

14. A configurable conductor network comprising at least one switching device comprising:

two separate electrodes, at least one of which being a reactive metal electrode; and

a solid state electrolyte arranged between the electrodes and being capable of electrically isolating said electrodes to define said off-state,

wherein the electrodes and the solid state electrolyte form a redox-system having a minimum voltage to start a redox-reaction, the redox-reaction resulting in the generation of metal

ions to be released into the solid state electrolyte, and the metal ions being reduced to increase a metal concentration within the solid state electrolyte, and

wherein an increase of the metal concentration results in a conductive metallic connection bridging the electrodes to define the on-state.

15. The network according to claim 14, further comprising at least one conductive line for connecting at least two of the switching devices.

16. A configurable integrated circuit comprising at least switching device comprising:

two separate electrodes, at least one of which being a reactive metal electrode; and

a solid state electrolyte arranged between the electrodes and being capable of electrically isolating said electrodes to define said off-state,

wherein the electrodes and the solid state electrolyte form a redox-system having a minimum voltage to start a redox-reaction, the redox-reaction resulting in the generation of metal ions to be released into the solid state electrolyte, and the metal ions being reduced to increase a metal concentration within the solid state electrolyte, and

wherein an increase of the metal concentration results in a conductive metallic connection bridging the electrodes to define the on-state.

17. The configurable integrated circuit according to claim 16, further comprising at least one metallization having at least one metal line,

wherein at least one of said switching device is integrated in said at least one metal line.

18. The configurable integrated circuit according to claim 16, wherein the metal line material is the same as said reactive metal electrode material.

19. The configurable integrated circuit according to claims 16, further comprising at least two different metallizations, the metallizations being connected by at least one through via, wherein at least one of said switching devices is integrated in the at least one through via.

20. The configurable integrated circuit according to claim 19, wherein the through via material is chosen to be the same as said reactive metal electrode material.

21. A method for preparing a switching device in a configurable integrated circuit that can be irreversibly switched from an electrically isolating off-state into an electrically conducting on-state for use in a configurable interconnect, the device having two electrodes and a solid state electrolyte that form a redox-system having a minimum voltage to start a redox-reaction, the redox-reaction resulting in the generation of metal ions to be released into the solid state electrolyte, and the metal ions being reduced to increase a metal concentration within the solid state electrolyte where an increase of the metal concentration results in a conductive metallic connection bridging the electrodes to define the on-state, comprising:

creating a first metal line opening;

filling said first metal line opening with the solid state electrolyte;

creating a second metal line opening;

filling said second metal line opening with reactive metal electrode material;

creating a third metal line opening; and

filling the third metal line opening with inert electrode material.

22. The method according to claim 21, wherein steps of creating second and third metal line openings and filling second and third metal line openings with reactive metal electrode material, respectively, are simultaneously effected.